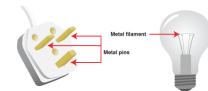


Conduction & Insulation

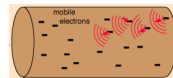
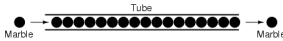
Mr. Sudbury

Conductor Properties

- ▶ **Conductors**
 - A material through which electric charge can easily flow.
 - (There are different levels of conductivity.)
 - Some lit light bright, others were dim → this is a measure of how much charge is getting through.
 - Charge flows because of the availability of loosely held electrons, which move throughout the conductive material.



Conductor



- ▶ A conductor is “full” of “free” (loose) electrons. Like the marbles in the tube, as soon as any charge (marble) enters the tube, one marble /charge instantly leaves the tube
- ▶ Materials are *conductive* materials because the outer electrons in each atom can easily come or go, and are called **free electrons**.

Insulator Properties



- ▶ **Insulator**
 - “A material that is a poor conductor of electricity.”
 - Because – Electrons are tightly bound and remain with their particular atoms.
 - An insulator does not respond to an electric field.
 - In *insulating* materials, the outer electrons are not so free to move.

Conductors & Insulators Examples

- | | |
|---|--|
| <ul style="list-style-type: none"> ▶ Conductors <ul style="list-style-type: none"> ◦ All metals – (some more conductive than others) ◦ Graphite ◦ Ionic Solutions | <ul style="list-style-type: none"> ▶ Insulators <ul style="list-style-type: none"> • Air • Wood • Rubber • Glass • Plastic |
|---|--|

Conductors Vs. Insulators

- ▶ **Semiconductors** are materials that can be made to behave like either an insulator or a conductor.
 - Computer circuit parts
- ▶ Certain metals, at very low temperatures, can be superconductors. **Superconductors** are excellent conductors with almost zero resistance to the flow of charge.



The End

- Conductors and Insulators

